

CENTER FOR BEAM PHYSICS SEMINAR

"Quality Particle Beams from Laser Injection into Laser Wake Fields"

Dr. John R. Cary
University of Colorado, Boulder

Friday, May 11, 2001, 10:30 AM
Bldg. 71 Albert Ghiorso Conference Room, LBNL

Summary:

Self consistent simulations of the colliding pulse injection scheme have shown that quality beams can be formed and accelerated by laser-plasma wakefields. Previous test-particle simulations were essentially one-dimensional. In two dimensions, the transverse variation of the acceleration gradient leads to beams with 100% energy spread. At modest injection energies, these beams are then dissipated by the defocusing forces as they slide back in the accelerating bucket. By injecting electrons at an optimum energy, the highest energy particles are accelerated and focussed, while the lower energy particles are lost through defocusing. The result is a beam of 3% energy spread and transverse emittance of 0.02 mm-mrad.

Biographical data and research interests:

Doctorate at U. C. Berkeley in 1979, advisor Allan Kaufman, LANL 78-80, Institute for Fusion Studies (U. Texas) 1980-1984. Since 1984 he has worked as a professor at the University of Colorado at Boulder, serving as Dept. Chair and faculty mentor. He is currently the Director of the Center for Integrated Plasma Studies.

Founded Tech-X Corporation in 1994. Tech-X Corporation specializes in software/computation for the scientific community. Current projects include modeling of advanced accelerator concepts and, for the fusion community, the National Transport Code Collaboration.

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